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The Effects of Teacher Instructional Efficacy on Mathematical Skill Acquisition: The Students Viewpoint

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Abstract

Teacher instructional efficacy is an essential part of the mathematics learning process. When a mathematics teacher possesses a high level of instructional efficacy they can effectively influence a mathematics student's skill acquisition. This researcher examined what extent 5th-grade mathematics students perceive teacher instructional efficacy to be involved in the mathematical skill acquisition. In addition, the study attempted to determine the relationship between the students' perception of instructional efficacy as it relates to mathematical skill acquisition and the students' cumulative mathematics grade point averages. Students (N=21) from a southeastern Michigan school district responded to a Likert scale survey containing fifteen statements.

The results of the survey indicated that 80% of the students had a high level of instructional efficacy agreement and 20% of the students had a medium level of instructional efficacy agreement. This researcher calculated a statistical weak correlation between the students' level of agreement and students' cumulative mathematics grade point averages. In addition, since the students' cumulative mathematics grade point averages and their levels of instructional efficacy agreement are both high, it was difficult for this researcher to determine the strength of the relationship between the two variables.

Chapter I

Introduction

Teacher instructional efficacy is important to the success of a student and the class as a whole. Mathematics teachers that possess a high level of efficacy believe that they can strongly influence a mathematics student's skill acquisition. Mujis and Reynolds (2002) review a variety of studies suggesting students that teachers with high efficacy beliefs performed better on achievement tests than their peers who are taught by teachers with low efficacy beliefs. Mujis and Reynolds (2002) suggest low teacher efficacy beliefs have also been linked to low expectations of student achievement.

The relationship between a teacher and a student is vital to the student's mathematical skill acquisition. There are numerous qualities and characteristics that a teacher possesses that contribute to their instructional efficacy. This researcher has chosen to focus on the following traits:

1) Communication Skill/Feedback,

2) Enthusiasm,

3) Sensitivity/Support,

4) Classroom Environment,

5) Classroom Management.

All of these traits are suggested to be linked to student mathematical skill acquisition.

The purpose of this study is to explore the relationship between student perceptions of the five teacher instructional efficacy traits and mathematical skill acquisition. Students from a 5th grade elementary school in a southeastern Michigan School District will be selected to participate in the study. A tangible result of mathematical skill acquisition is the students'

cumulative mathematical grade point averages. These cumulative grades will be compared to the students' perceptions of teacher instructional efficacy.

Problem Statement

Teacher instructional efficacy has been suggested by many researchers to be a powerfully related to achievement. Teacher instructional efficacy can assist a teacher in many meaningful educational outcomes. The students' perceptions of teacher instructional efficacy are also involved in the educational process. This study will examine the relationship between the students' perceptions of teacher instructional efficacy and the students' cumulative mathematical grade point averages. Along with this relationship, the five teacher instructional efficacy traits will be examined to determine what extent, from the students' viewpoint, they relate to mathematical skill acquisition.

Elements of the Problem

As a student continues the academic achievement process, mathematics becomes an increasingly challenging and complex subject. Elementary school teachers' perceptions of their own sense of instructional efficacy play a role in mathematical skill acquisition. It is known that teachers deeply influence children and their academic achievement. However, there are other individuals involved in the skill acquisition process – the children. Students make judgements and have perceptions about the teacher's instructional traits all the time. This raises the question: What are the students' perceptions of the teacher's teacher instructional efficacy qualities in regards to mathematical skill acquisition?

Purpose of Study

In the past two decades, researchers have found links between student achievement and three kinds of efficacy beliefs – student, teachers' beliefs about collective efficacy of their

school, and teacher efficacy as noted by Goddard, Hoy, and Hoy (2004). The purpose of this quantitative study is to examine to what extent students perceive teacher instructional efficacy to be involved in the mathematical skill acquisition. In addition, the study will attempt to determine the relationship between this student perception and the students' cumulative mathematics grade point averages. The literature is plentiful in the area of teacher instructional efficacy and student perceptions. This study will extend and add to previous research. Therefore, this researcher will add to previous teacher efficacy research by examining the extent to which students perceive the five chosen traits of teacher instructional efficacy as they relate to mathematical skill acquisition. In addition, this researcher will extend the previous research by investigating the correlation between students' perceptions of teacher instructional efficacy and students' cumulative mathematics grade point averages.

Research Questions

There are numerous qualities that relate to teacher instructional efficacy. This researcher has chosen to focus on five specific instructional qualities. This researcher plans to extend and add to previous research by exploring the following questions:

1. To what extent do students agree or disagree that the five teacher instructional efficacy qualities are significant to mathematical skill acquisition?
2. To what extent is there a correlation between students' perceptions of teacher instructional efficacy and students' cumulative mathematics grade point averages?

Definition of Terms

In an effort to assist in the understanding of terminology, this researcher has added the following terms and definitions to the study.

Teacher Instructional Efficacy – The extent to which the teacher believes he or she has the capacity to instruct students which results in affecting student performance.

Collective Efficacy – The perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students. (Goddard, Hoy, and Woolfolk Hoy (2002))

Classroom Management – Ways of organizing the resources, pupils, and helpers in a classroom that teaching and learning can proceed in an efficient and safe manner. (primarydandt.org)

Student Socioeconomic Status (SES) – A measure of an individual or family's relative economic and social status. (nces.ed.gov)

Skill acquisition – The cognitive process of acquiring skill or knowledge. (answers.com)

Chapter II

Literature Review

Teacher instructional efficacy has significant implications for mathematical academic achievement. A teacher's instructional efficacy belief is a judgment of his or her capabilities to instruct students which leads to desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated. Theories of teacher efficacy proposes that level of efficacy affects the amount of effort a teacher will expend in a teaching situation and the persistence shown in the face of obstacles. There have been numerous studies conducted over the past 25 years researched from the teacher's perceptions. Many researchers have found significant positive relationship between teacher instructional efficacy and both success and failure. The research that will be conducted is centered on participants that are currently enrolled in upper elementary education.

Tschannen-Moran, Hoy, and Hoy (1998) have identified and reviewed virtually all sources between 1974 and 1997 that used the term "teacher efficacy". They identify numerous variables that effect, directly or indirectly, teacher efficacy.

This researcher has recognized five literature constructs, as presented by the literature, that suggest direct impact between teacher instructional efficacy and mathematical skill acquisition.

These variables are:

Dependent variable:

1. Mathematical skill acquisition

Independent variables:

1. Communication skill/feedback

2. Enthusiasm
3. Sensitivity/support
4. Classroom Environment
5. Classroom Management

This chapter will review the literature of several researchers who have studied the constructs mentioned previously as they pertain to teacher instructional efficacy and its relationship to skill acquisition.

Mathematical Skill Acquisition

Teacher instructional efficacy plays a very important role in the development of a student's mathematical achievement. Parental involvement, students' prior academic performance, and the community are just a few of the numerous factors that contribute to a student's mathematical knowledge acquisition.

Goddard, Hoy, and Hoy (2000) suggest that when collective efficacy is high, teachers in a school believe they can reach their students and that they can overcome negative external factors and influences. In ground breaking study of collective teacher efficacy and student skill acquisition, Goddard, Hoy, and Hoy (2000) conclude: (a) student achievement is significantly and positively related to collective efficacy and (b) collective efficacy has a greater effect on student achievement than does student socioeconomic status (SES). These conclusions suggest to schools and teachers struggling to increase students' mathematical achievement and overcome the association between SES and achievement. When teacher instructional efficacy is high, the teacher can influence a student's mathematical achievement in several ways.

Zeldin and Pajares (2000) state that teachers effect achievement by assisting the mathematics student with his or her learning skills. In general, mathematics involves the use of mastery learning. Zeldin and Pajares (2000) explain that the students will demonstrate mastery of one topic before proceeding to increasingly challenging material. Zeldin and Pajares (2000 note, however, sometimes while in the process of learning the mastery skills, a student may become confused or frustrated. Hence, teaching strategies need to be amended.

Goddard, Hoy, and Hoy (2004) indicate that a teacher's sense of efficacy is a significant predictor of productive teaching practices compared to a teacher with lower efficacy. Teachers with strong perceptions of efficacy tend to use classroom strategies that are well organized and student-centered. Goddard, Hoy, and Hoy (2004) continue to state that these studies provide considerable explanation for the positive link between teacher efficacy and student achievement. According to the study, by teaching effective learning strategies, not only do teachers promote student achievement, but they also promote the students' belief that they can control their success. Hence, students are likely to be motivated to engage in mathematical tasks.

Communication skill/ feedback

Communication skills and feedback help to create a better understanding of mathematical concepts. According to Schweinkel, Meyer, and Turner (2006), feedback is most useful when it is (a) immediate, (b) links success with effort, and (c) provides information about improvement and mastery. Schweinkel, Meyer, and Turner (2006), suggest that providing substantive feedback about competence and mathematical goal progress increases efficacy, enhances interest and persistence, and increases intrinsic motivation.

Schweinkel, Meyer, and Turner (2006) conducted a Likert scale survey on the students' view of social and personal affect, efficacy, and challenge/importance during mathematical

instruction. They also conducted a qualitative investigation of teacher instructional communication. There were several findings that emerged from the research that brought to light on a group of upper elementary students experiences in their mathematics classrooms. They found that when teachers demonstrate the enjoyment of mathematics, alleviate frustration, and provide positive, substantive feedback it leads to improved efficacy and valuing of mathematics.

Woolfolk and Brooks (1985) present an overview of research on the effect of teachers' verbal and non-verbal behavior in the classroom. Particularly important in teaching are the functions of (a) indicating attitudes, (b) revealing emotional states, (c) supplementing, reinforcing, or regulating verbal exchanges, (d) being persuasive, and (e) influencing the performance of others. According to the study, if students receive praise for correct answers and more differentiated feedback then the teacher generally creates a warm socio-emotional climate for the student.

Woolfolk and Brooks (1985) review studies suggesting that when making judgments about their teachers' attitudes, students consider the teachers' non-verbal behaviors. The students evaluate their teachers positively and feel liked by their teachers when the teachers lean forward, smile, nod affirmatively, and maintain good eye contact. Woolfolk and Brooks (1985) cite a study in which interviews were conducted to determine what cues students use to decide how well they are doing in class. Findings indicate that cues from the teacher, particularly public feedback, are the main sources for students who conclude that they are "smart" and perform well. Non-verbal behavior also appears to play a role.

Enthusiasm

Tschannen-Moran and Woolfolk-Hoy (2001) state teacher efficacy has proved to be strongly related to many educational outcomes such as teachers' enthusiasm as well as student outcomes such as achievement. Enthusiasm is a behavior that is important to many teaching functions. Tschannen-Moran and Woolfolk-Hoy (2001) suggest excitement lead teachers to have a greater desire to stay in the field of teaching.

Murphy and Walls (1994) cite, during their presentation at the American Educational Research Association's annual meeting, an investigation involving 1,300 students of various grade levels. The students indicated that enthusiasm is a preferred trait that helps to characterize the ideal teacher, and more enthusiastic teachers have been seen as fostering a more positive and pleasant mathematics classroom environment. Not only does teacher enthusiasm help make a mathematics course more enjoyable and entertaining for students and the teachers, it has also been shown by Coats and Smidchens (1966) to help the learner retain larger amounts of information than when students are taught by a static speaker/teacher.

Waxman and Eash (1983) conducted a study involving the classroom variables and students' perceptions to examine teacher's effectiveness. Waxman and Eash (1983) also analyzed a student self-report instrument done with fourth and sixth grade students. The data collections consisted of eight classroom process variables, which include student age, sex, and socioeconomic status. Results indicated enthusiastic teaching to be a significant predictor of a student's academic achievement in the younger grades.

Sensitivity

A study conducted by Wentzel (1997) examined the relationship of perceptions of caring teachers to young adolescents' motivation to achieve academic and social outcomes. Wentzel

(1997) utilized a longitudinal study on 375 sixth graders for three years to address the characteristic of pedagogical caring. The quantitative study was designed to focus on the students' perceptions of teacher caring rather than the teacher's perceptions. The results of the questionnaires suggest that perceptions of caring teachers are related to students' academic effort. The results provide strong evidence in support of the notion that students are more likely to participate in classroom activities if they feel supported and valued. Teachers that show care were described as demonstrating democratic interaction styles modeling a caring attitude toward their own work, and providing constructive feedback.

Murdock and Miller (2003) maintain that students' perceived relationships with teachers affect the development of their motivation. This motivational drive in turn exhibits higher levels of academic achievement. These suggestions were determined by conducting a study in one middle school consisting of 206 seventh grade students. When analyzing teacher caring, the researchers used a Likert scale to determine correlation between teacher caring and three aspects of the social motivational climate of the classroom: teacher respect and fairness, teacher expectations, and teacher competence/commitment.

Murdock and Miller (2003) also used two data analytic strategies to examine the role that perceived teacher care plays in the development of student motivation. Findings from the study propose that higher quality teacher-student relationship predict stronger motivation. In addition, the study indicates that if a student sees his or her teacher as supportive and caring the likelihood of the student valuing education and setting high educational goals for his or herself increase.

Classroom Environment

The classroom is an inherently social place. Ryan and Patrick (2001) contend that teachers assist to constructing the classroom environment by creating norms and rules for student

behavior and giving explicit messages regarding students' interactions. They investigate how the social environment of the classroom, created by the mathematics teacher, support or undermine students' engagements. In the study Ryan and Patrick (2001) explore the perceptions about both classmates and the mathematics teacher. The 233 students in this longitudinal study were given a 5-point Likert scale survey during the seventh grade (wave 1) and eighth grade (wave 2). The items were specific to the mathematics class, the perceptions surrounding the classroom environment, and personal engagement. The results report a positive correlation between the classroom social environment and efficacy with teachers. The study indicates that students tend to engage in more adaptive learning patterns when:

- they believe they are encouraged to know, interact with, and help classmates during mathematics lessons.
- they view their classmates as one where students and their ideas are respected and not belittled.
- students perceive their teacher as understanding and supportive.
- they feel their teacher does not publicly identify students' relative performance.

Ryan and Patrick (2001) conducted a study to examine whether 602 fifth grade students' perceptions of the classroom environment were related to their engagement in the classroom and whether those relations were mediated by personal beliefs (academic and social efficacy). The students completed Likert survey questions and were encouraged to ask questions. The research found strong evidence that the classroom environment is important to student academic engagement. When students feel a sense of emotional support and encouragement from their teacher they are then more likely to discuss their work and engage in task-related interaction.

Students' classroom interaction about mathematics was related significantly to their mathematics achievement.

The Ryan and Patrick (2001) study helps to explain the association between teacher support and student achievement as well as the association between classroom environment and achievement. The findings support the researchers' assumption that the relations between the classroom environment and students' engagement are strong and interwoven. In particular, the students' perceptions of their teacher as being emotionally and academically supportive were closely connected with their own focus on developing competence in mathematics.

Classroom Management

According to Morris-Rothschild and Brassard (2006), teacher efficacy for classroom management remains an unexplored area for researchers. Morris-Rothschild and Brassard (2006) continue by stating that teachers with low efficacy have been found to criticize students for failure and demonstrate a tendency to give up easily when faced with difficult situations. The researchers surveyed 283 teachers from two school districts using a Likert survey to measure the teachers' self-perception of competence in the area of classroom management and discipline. The findings suggest efficacious teachers judge themselves as able to cope effectively with student conflicts and are less likely to become preoccupied with their own deficiencies. This allows the teacher to engage in managing conflicts, which benefits both themselves and the students. The research also points out that highly efficacious teachers spend more time solving individual students' problems than teachers with a weak sense of efficacy because they are more willing to take personal responsibility for addressing students' behavioral issues with in the classroom setting.

Baker (2005) examines teachers' beliefs about their interpersonal self-efficacy regarding general classroom management skills and their readiness to implement specific behavior management techniques to meet the academic needs of the students. For the study, 885 surveys were distributed to middle school teachers. A Teacher Interpersonal Self-Efficacy Scale was used to measure a teacher's perception of self-efficacy for general classroom management skill and for consulting with colleagues. Also, the participants rated themselves using a Likert scale to examine their perceptions of their own self-efficacy for overall classroom management. The areas in which teachers reported the greatest sense of efficacy were in establishing rules for students and accessing colleagues for support. However, when challenges arose from difficult and defiant students, teachers reported far less confidence in successfully remedying those situations. This research supports the concept that when teachers feel confident in their overall effectiveness for structuring and maintaining a positive classroom environment, they also fell more ready, able, and willing to support students.

Conclusion

Based on the review of literature, it can be concluded that there is a need to examine the constructs of teacher instructional efficacy from the student's viewpoint as it relates to mathematical skill acquisition. Many of the studies presented in the literature investigate various constructs that effect teacher instructional efficacy. The purpose of this study is to extend the research on teacher instructional efficacy attributes as they relate to mathematical skill acquisition. In addition, the intent of the research is to gain insight on the student perceptions of the five aforementioned teacher instructional efficacy constructs. Findings in the literature provide a framework for this study to conduct a quantitative research in examining the extent that teacher instructional efficacy effects mathematical skill acquisition.

Chapter 3

Research Design

For the purpose of this study, this researcher will explore the students' perceptions of teacher instructional efficacy as it relates to mathematical skill acquisition. In conjunction with this quantitative research design, this research will utilize a Likert survey consisting of 15 statements. The survey will encompass the five teacher instructional efficacy qualities. In addition to building on prior research, this researcher will attempt to determine the relationship between the students' perceptions of teacher instructional efficacy and the students' cumulative mathematics grade point averages.

The research will be conducted in a 5th grade elementary classroom in a southeastern Michigan school district. The principal of the elementary school will be contacted and presented with a sample of the survey and the Informed Consent Form to approve. Upon approval, this researcher will contact with a purposefully selected 5th grade classroom teacher and the principal of the elementary school. The 5th grade classroom teacher will be given the proper number of copies of the Informed Consent Form to be disbursed to the students and their parent(s)/guardian(s).

This researcher will administer surveys to the 5th grade students by this researcher. Students will be told the purpose of the survey is to find out what the students think about their teacher's instructional qualities/characteristics. The students will be informed that participating in the study is voluntary and that the information will be kept confidential. The students will be guided through an example of how to answer a Likert survey statement. Students will be encouraged to ask questions if they feel at all confused.

This researcher, to avoid history effect, will be in the 5th grade classroom during only one school day to administer the survey. In an effort to control any maturation effect, the survey will be done in the shortest time possible. This would attempt to eliminate any biological or psychological processes to occur during the survey participation. All of the participants are similar in age (within the same 5th grade classroom). This will ensure that the answers given by the students reflect the students' perceptions of teacher instructional efficacy and not the effects of maturation. Lastly, to avoid experimental mortality, the researcher will make sure that all of the participants complete their surveys.

Once again, this researcher will administer the survey to the students and determine the students' level of agreement of teacher instructional efficacy as it relates to mathematical skill acquisition. Participants will be categorized into three categories: high, medium, and low levels of agreement. Participants' cumulative mathematics grade point averages will be collected from their teacher and reviewed by this researcher. These grade point averages will then be compared with the levels of agreement to determine if there is any correlation between student perceptions of teacher instructional efficacy as it relates to mathematical skill acquisition and the students' cumulative mathematics grade point averages.

Theoretical Framework

This action research is not based on a specific theory. It is intended to contribute to the knowledge base needed for enhancing practice in the classroom. It is this researcher's hope that the results of this study will help practitioners identify problems and assist with the solutions related to mathematical skill acquisition. The students' level of agreement with teacher instructional efficacy will be derived from a Likert scale survey. The levels will then be compared with the students' cumulative mathematics grade point averages. This study will be

carried out to conclude if there is any type of relationship between the students' cumulative mathematics grade point averages and their perceptions of teacher instructional efficacy.

Sampling

The participants will consist of a 5th grade elementary school classroom in a southeastern Michigan school district. Because the students are assigned to a particular 5th grade classroom, this researcher used volunteer samples as the sampling procedure. It is not feasible to conduct this survey to every 5th grade student in the entire country. Hence, the students selected in this sample will represent all 5th graders in the United States.

Variables

The variables that this researcher wants to investigate are mathematical skill acquisition, which is the dependent variable and teacher instructional efficacy qualities, which are the independent variables. This researcher has chosen to focus on five independent teacher instructional efficacy qualities: 1) Communication Skill/Feedback, 2) Enthusiasm, 3) Sensitivity/Support, 4) Classroom Environment, and 5) Classroom Management. This researcher will research the students' perceptions of the five teacher instructional efficacy qualities and then compare the results to the students' cumulative mathematics grade point averages.

Methods of Data Collection

The 5th grade participants will be given a Likert scale survey to access their perceptions of the five teacher instructional efficacy qualities. There will be a total of 15 statements focused on the five researched independent variables. Each variable will have three statements associated with the variable. Statements 1 – 3 addressed the topic of sensitivity. Statements 4 – 6 addressed the topic of classroom environment. Statements 7 – 9 addressed the topic of enthusiasm. Statements 10 – 12 addressed the topic of communication/feedback. Statements 13

– 15 addressed the topic of classroom management. The data presented in Table 1 thru 15 summarizes the responses to the surveys. Each survey will be administered to each 5th grade student in the classroom. There will be no time limit for the survey except that it will be completed in class that particular day. The results of the surveys will then be compared to the students' cumulative mathematics grade point averages.

Data Analysis

Quantitative data will be generated using a four point Likert scale. The ratings are as follows: 4-strongly agree, 3-agree, 2- disagree, and 1-strongly disagree. Each student will be categorized into an agreement level of high, medium, and low. Using the Likert scale, a score of 15-29 will be considered low agreement, a score of 30-44 will be considered medium agreement, and a score of 45-60 will be considered high agreement. The students' cumulative mathematics grade point averages will be compared with the students' level of agreement that teacher instructional efficacy is significant to mathematical skill acquisition. In addition, the individual student cumulative mathematics grade point averages will be compared with the student survey results on a scattergram to determine the degree of correlation.

Ethics and Human Relations

All participants will be made aware that they have the right to withdraw from the study at anytime. No participants' names or school name will be identified in the data in order to protect their privacy. This researcher will retain, for a minimum of three years, all instruments used in the study. Permission will be requested from the Marygrove College Institutional Review Board and all necessary precautions will be taken for the protection of the participants. These precautions will be taken to assume that the participants will not be exploited or embarrassed by their grade point averages or survey results.

Timeline

This study will be conducted within an approximate two-week period. This includes the conducing of the 5th grade survey, tallying, and comparing the results with the students' cumulative mathematics grade point averages.

Summary

Over the past 25 years there have been many studies conducted on the topic of teacher instructional efficacy. According to Guskey and Passaro (1994), a number of educational researchers have identified teachers perceived sense of efficacy in teaching and learning situations as a powerful variable in studies of instructional effectiveness, including skill acquisition. In review of the literature, this researcher has determined there are multiple constructs surrounding the idea of teacher instructional efficacy. This researcher has chosen to focus on five specific constructs:

1) Communication Skill/Feedback,

2) Enthusiasm,

3) Sensitivity/Support,

4) Classroom Environment,

5) Classroom Management

According to Patrick, Ryan, and Kaplan (2007), students' perceptions of the classroom influence students' beliefs about themselves and their schoolwork, and these beliefs, in turn, influence skill acquisition. The teacher is a significant factor in classroom and mathematical achievement. The basis of this quantitative research is to explore the teacher's instructional efficacy as it relates to mathematical skill acquisition from the students' viewpoint. In addition,

this researcher will attempt to determine the relationship, if one exists, between the students' viewpoint and the students' cumulative mathematics grade point average.

This researcher believes that there needs to be more studies to further explore and identify the relationship between students' perceptions of not only teacher instructional efficacy traits, but also other classroom variables as they related to mathematical skill acquisition. It is this researcher's hope that the information collected and summarized in this research will prove useful information for present and future educators. This researcher believes that teachers need to take into consideration the students' perceptions regarding teacher instructional efficacy as it relates to mathematical skill acquisition.

Chapter IV

Introduction

The intent of this quantitative study is to examine to what extent students perceive teacher instructional efficacy to be involved in the mathematical skill acquisition. This researcher used a four point Likert scale survey (see Appendix D) to generate the necessary quantitative data. The ratings were as follows: 4-strongly agree, 3-agree, 2- disagree, and 1-strongly disagree. Each of the twenty-one fifth grade students from a southeastern Michigan school district was categorized into an agreement level of high, medium, and low. Using the Likert scale, a score of 15-29 was considered low agreement, a score of 30-44 was considered medium agreement, and a score of 45-60 was considered high agreement. The students' cumulative mathematics grade point averages were then compared with the students' level of agreement that teacher instructional efficacy is significant to mathematical skill acquisition. In addition, the individual student cumulative mathematics grade point averages were compared with the student survey results on a scatterplot to determine the degree of correlation.

Presentation of Data

This researcher provided the Likert scale survey to the principal and fifth grade teacher on May 7, 2007. In addition, this researcher provided copies of the Informed Consent Form and the Acknowledgement and Consent Form to the fifth grade mathematics teacher for passing out to the teacher's students. This researcher obtained the signed Acknowledgement and Consent Form from the teacher for the twenty-one students that participated. On May 17, 2007 this researcher administered the survey to the twenty-one fifth grade mathematics class students.

The twenty-one southeastern Michigan fifth grade students responded, “strongly agree, agree, disagree, or strongly disagree” to each one of the fifteen statements in the survey. The survey addressed the five different traits of instructional efficacy as researched by conducting a literature review. Statements 1 – 3 addressed the topic of sensitivity. Statements 4 – 6 addressed the topic of classroom environment. Statements 7 – 9 addressed the topic of enthusiasm. Statements 10 – 12 addressed the topic of communication/feedback. Statements 13 – 15 addressed the topic of classroom management. The data presented in Table 1 thru 15 summarizes the responses to the surveys.

Table 1 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher respects my opinions on math.”

Table 1. Mathematics Opinion.

Response	Response-percent	Number
Strongly Agree	38%	n = 8
Agree	48%	n = 10
Disagree	14%	n = 3
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students’ perceptions of the teacher’s respect for the students’ mathematics opinions. 38% of the students surveyed responded strongly agree, 48% of the students responded agree, 14% of the students responded disagree and none of the students responded strongly disagree. This indicates that 86% of the students surveyed agree that the teacher respects the student’s opinions in mathematics.

Table 2 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher really understands how I feel about math.”

Table 2. Mathematical Feelings.

Response	Response-percent	Number
Strongly Agree	38%	n = 8
Agree	52%	n = 11
Disagree	5%	n = 1
Strongly Disagree	5%	n = 1

The preceding are the results of the data collected regarding the students’ perceptions of the teacher’s understanding for the students’ feelings. 38% of the students surveyed responded strongly agree, 52% of the students responded agree, 5% of the students responded disagree and 5% of the students responded strongly disagree. This indicates that 90% of the students surveyed agree that the teacher understands the student’s feeling regarding mathematics.

Table 3 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher helps me when I’m confused about a math problem”.

Table 3. Confusion With a Mathematical Problem.

Response	Response-percent	Number
Strongly Agree	71%	n = 15
Agree	29%	n = 6
Disagree	0%	n = 0
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's helping the students' when they are confused about a mathematics problem. 71% of the students surveyed responded strongly agree, 29% of the students responded agree, 0% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 100% of the students surveyed agree that the teacher helps the student when they are confused about a mathematical problem.

Table 4 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher allows us to discuss our math work with each other".

Table 4. Discussing Mathematics Work with Each Other.

Response	Response-percent	Number
Strongly Agree	43%	n = 9
Agree	57%	n = 12
Disagree	0%	n = 0
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's allowing the students to discuss their mathematics work with each other. 43% of the students surveyed responded strongly agree, 57% of the students responded agree, 0% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 100% of the students surveyed agree that the teacher allows the student to discuss their mathematics work with each other.

Table 5 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher encourages us to share math ideas with each other".

Table 5. Discussing Mathematical Ideas with Each Other.

Response	Response-percent	Number
Strongly Agree	33%	n = 7
Agree	57%	n = 12
Disagree	10%	n = 2
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's encouraging the students to share their mathematics ideas with each other. 33% of the students surveyed responded strongly agree, 57% of the students responded agree, 10% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 100% of the students surveyed agree that the teacher encourages the student to share their mathematics ideas with each other.

Table 6 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher encourages us to be helpful to other students with their math work”.

Table 6. Helping Others with Their Mathematics Work.

Response	Response-percent	Number
Strongly Agree	48%	n = 10
Agree	48%	n = 10
Disagree	5%	n = 1
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students’ perceptions of the teacher’s encouraging the students to be helpful with their classmates mathematics work. 48% of the students surveyed responded strongly agree, 48% of the students responded agree, 5% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 96% of the students surveyed agree that the teacher encourages the student to help others with their mathematics work.

Table 7 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher makes learning math fun”.

Table 7. Making Mathematics Fun.

Response	Response-percent	Number
Strongly Agree	57%	n = 12
Agree	24%	n = 5
Disagree	19%	n = 4
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's making learning mathematics enjoyable. 57% of the students surveyed responded strongly agree, 24% of the students responded agree, 19% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 81% of the students surveyed agree that the teacher make learning mathematics fun.

Table 8 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher shows excitement for math".

Table 8. Excitement for Mathematics.

Response	Response-percent	Number
Strongly Agree	67%	n = 14
Agree	19%	n = 4
Disagree	14%	n = 3
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's showing excitement for mathematics. 67% of the students surveyed responded

strongly agree, 19% of the students responded agree, 14% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 86% of the students surveyed agree that the teacher shows excitement for mathematics.

Table 9 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher’s excitement helps me to learn math better”.

Table 9. Excitement Helps Learning.

Response	Response-percent	Number
Strongly Agree	37%	n = 8
Agree	52%	n = 11
Disagree	10%	n = 2
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students’ perceptions of the teacher’s excitement helping students learn mathematics. 37% of the students surveyed responded strongly agree, 52% of the students responded agree, 10% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 90% of the students surveyed agree that the teacher’s excitement helps them with the learning process.

Table 10 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher explains math concepts well”.

Table 10. Explaining Mathematical Concepts.

Response	Response-percent	Number
Strongly Agree	34%	n = 7
Agree	52%	n = 11
Disagree	14%	n = 3
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's explanation of math concepts. 34% of the students surveyed responded strongly agree, 52% of the students responded agree, 14% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 86% of the students surveyed agree that the teacher explains mathematical concepts well.

Table 11 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher provides suggestions and feedback".

Table 11. Suggestions and Feedback.

Response	Response-percent	Number
Strongly Agree	10%	n = 2
Agree	80%	n = 16
Disagree	10%	n = 2
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's providing suggestions and feedback. 10% of the students surveyed responded

strongly agree, 80% of the students responded agree, 10% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 90% of the students surveyed agree that the teacher provides suggestions and feedback.

Table 12 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher allows me to ask math questions”.

Table 12. Asking Mathematical Questions.

Response	Response-percent	Number
Strongly Agree	56%	n = 12
Agree	29%	n = 6
Disagree	10%	n = 2
Strongly Disagree	5%	n = 1

The preceding are the results of the data collected regarding the students’ perceptions of the teacher’s allowing students to ask mathematics questions. 56% of the students surveyed responded strongly agree, 29% of the students responded agree, 10% of the students responded disagree and 5% of the students responded strongly disagree. This indicates that 85% of the students surveyed agree that the teacher allow students to ask questions regarding mathematics.

Table 13 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, “My math teacher will not allow students to make fun of other students’ math ideas in class”.

Table 13. Making Fun of Mathematical Ideas.

Response	Response-percent	Number
Strongly Agree	38%	n = 8
Agree	34%	n = 7
Disagree	18%	n = 4
Strongly Disagree	10%	n = 2

The preceding are the results of the data collected regarding the students' perceptions of the teacher's not allowing students to make fun of other students' mathematical ideas in class. 38% of the students surveyed responded strongly agree, 34% of the students responded agree, 18% of the students responded disagree and 10% of the students responded strongly disagree. This indicates that 72% of the students surveyed agree that the teacher does not allow students to make fun of other students' mathematical ideas in class.

Table 14 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher allows students to use different ways to learn math".

Table 14. Different Ways of Learning Mathematics.

Response	Response-percent	Number
Strongly Agree	29%	n = 6
Agree	56%	n = 12
Disagree	15%	n = 3
Strongly Disagree	0%	n = 0

The preceding are the results of the data collected regarding the students' perceptions of the teacher's allowing students to use different ways to learn mathematics. 29% of the students surveyed responded strongly agree, 56% of the students responded agree, 15% of the students responded disagree and 0% of the students responded strongly disagree. This indicates that 85% of the students surveyed agree that the teacher allow students to use different ways to learn mathematics.

Table 15 was utilized to test the degree to which the southeastern Michigan fifth grade students agreed or disagreed with, "My math teacher will not allow students to make fun when a student gives a wrong answer to a math problem".

Table 15. Making Fun of Mathematical Answers.

Response	Response-percent	Number
Strongly Agree	56%	n = 12
Agree	29%	n = 6
Disagree	10%	n = 2
Strongly Disagree	5%	n = 1

The preceding are the results of the data collected regarding the students' perceptions of the teacher's not allowing students to make fun of other students' mathematical answers. 56% of the students surveyed responded strongly agree, 29% of the students responded agree, 10% of the students responded disagree and 5% of the students responded strongly disagree. This indicates that 85% of the students surveyed agree that the teacher does not allow students to make fun of other students' mathematical answers.

The data collected from the survey indicates that 80% of the students (see appendix G) had a high level of instructional efficacy agreement and 20% of the students had a medium level of instructional efficacy agreement. It is also worth noting that 71% of the students had an "A" (4.0 or higher) (see appendix H) or a "B" (ranging from 3.0 to 3.99) cumulative mathematics grade point average. Only 29% of the students had a "C" (ranging from 2.0 to 2.99) or "D" (ranging from 1.0 to 1.99) cumulative mathematics grade point average. There were no students that had a "E" (ranging from 0.0 or 0.99) cumulative mathematics grade point average.

A scatterplot was used to determine a connection between the students' level of agreement and students' cumulative mathematics grade point averages. The two-dimensional graph is found in Appendix F. In addition to creating the graph, this researcher calculated the statistical correlation between the students' level of agreement and students' cumulative mathematics grade point averages. The correlation between the two quantitative variables was –0.0956. Therefore, the statistic shows a weak correlation between the students' level of agreement and students' cumulative mathematics grade point averages.

The data collected from the survey reveals the level of instructional efficacy agreement and the mathematics grade point average to be both fairly high. Hence, it is suggested that the relationship between the students' perceptions of teacher instructional efficacy and students' cumulative mathematics grade point averages appears reasonably weak.

Conclusion

This Likert scale survey explored the extent to which students agreed that teacher instructional efficacy qualities are significant to mathematical skill acquisition. The survey was designed to incorporate the five teacher instructional efficacy variables that were extensively

researched. The five variables are: 1) sensitivity, 2) classroom environment, 3) enthusiasm, 4) communication / feedback, and 5) classroom management.

Eighty percent of the fifth grade mathematics students surveyed had a high level of instructional efficacy agreement. Twenty percent of the fifth grade mathematics students surveyed had a medium level of instructional efficacy agreement. Therefore, the majority (80%) of the students agreed that teacher instructional efficacy traits are significant to mathematical skill acquisition.

The statistical correlation between the students' level of agreement and students' cumulative mathematics grade point averages was weak. Furthermore, since the students' cumulative mathematics grade point averages and their levels of instructional efficacy agreement are both high, it is hard for this researcher to establish the strength of the relationship between the two variables. Hence, this research question can not be properly answered because 71% of the mathematics students had cumulative mathematics grade point averages of 3.0 or higher.

Chapter 5

Introduction

This researcher has investigated five teacher instructional efficacy traits. These five traits were examined from the mathematics student's perspective in the form of a Likert scale survey. The results of the survey suggest the majority of mathematics students concluded teacher instructional efficacy is significant to mathematical skill acquisition. This researcher conducted the survey and a statistical correlation, which will be summarized. Moreover, an overview of the Likert scale survey and its statistical results will be provided. After providing a summary of the results, recommendations will be presented by this researcher. These recommendations will give direction to future research needed to gain more insight into the significance of teacher instructional efficacy as it relates to mathematics students obtaining mathematical skill.

Summary

This researcher explored the students' perceptions of teacher instructional efficacy as it relates to mathematical skill acquisition. An extensive review of literature was completed including journal articles, targeted educational magazines, ERIC databases, and doctoral level dissertations. A 15 statement Likert scale survey was administered to 21 Southeastern Michigan fifth grade mathematics students. The survey was conducted to determine the students' perceptions of teacher instructional efficacy. In addition, the survey was meant to contribute to the knowledge base for improving mathematical strategies and practices in the classroom.

Upon gathering the survey results, levels of agreement were ascertained. The three levels were: high, medium, and low. These levels were calculated by compiling the aggregate point totals from the 15 statement Likert scale survey. The levels were then compared with the

mathematics students' cumulative mathematics grade point averages. Upon the comparison, the degree of correlation was determined. The correlation was revealed to be weak.

Conclusions

The data from the Likert scale survey revealed 80% of the fifth grade mathematics students had a high level of instructional efficacy agreement. The remaining 20% of the fifth grade mathematics students had a medium level of instructional efficacy agreement. Therefore, the results suggest that the five teacher instructional efficacy traits are significant to mathematical skill acquisition. These results address the first research question: to what extent do students agree or disagree that the five teacher instructional efficacy qualities are significant to mathematical skill acquisition?

Based on the results of this survey and the review of literature regarding the five teacher instructional efficacy traits, teacher instructional efficacy has significant implications for mathematical skill acquisition. Both students and educators agree teacher instructional efficacy is a prevailing influence on students' mathematical achievements. It is important for teachers to possess high levels instructional efficacy traits for successful skill acquisition. Furthermore, the literature review suggests that mathematics students that have a teacher with high instructional efficacy performed better on achievement tests than their peers who are taught by teachers with low instructional efficacy.

The second research question asked the extent there is a correlation between the students' perceptions of teacher instructional efficacy and students' cumulative mathematics grade point averages. The statistical correlation between the two variables was shown to be weak. Since the two variables are both high numerically, it is difficult to determine the strength of the relationship between the two variables.

Recommendations

It is this researcher's recommendation that further research take place regarding the student perceptions teacher instructional efficacy on mathematical skill acquisition. Research needs to be carried out on other teacher instructional efficacy qualities and characteristics. This may provide further insight to instructional efficacy's role in mathematical skill acquisition.

In the past 25 years, there have been numerous studies conducted based on teacher perceptions of instructional efficacy. There needs to be more studies conducted from the students' viewpoint. This would allow educators and researchers to gain more insight into how students acquire mathematical skill.

This research concludes that there should be more studies surrounding the relationship between teacher instructional efficacy and grade point averages. In addition, a larger sample size consisting of multiple districts may reveal different outcomes. This would potentially allow for the correlation statistic to be more pronounced. Finally, it is this researchers hope that educators will take into consideration that teacher instructional efficacy qualities can strongly influence mathematical skill acquisition.

References

Baker, P.H. (2005). Managing Student Behavior: How Ready are Teachers to Meet the Challenges? *American Secondary Education*, 33(5), 51-63. Retrieved March 31, 2007 from ERIC database.

Coats, W. & Smidchens, W. (1966). Audience Recall as a Function of Speaker Dynamism. *Journal of Educational Psychology, 57,* 189-191. Retrieved March 31, 2007 from ERIC database.

Goodard, R., Hoy, W.K., & Hoy, A.W. (2004, April). Collective Efficacy Beliefs: Theoretical Developments, Empirical Evidence, and Future Directions. *Educational Researcher,* 33(3), 3-13. Retrieved October 10, 2006 from ERIC database.

Goodard, R., Hoy, W.K., & Hoy, A.W. (2000). Collective Teaching Efficacy: Its Meaning, Measure, and Impact on Student Achievement. *American Educational Research Journal,* 37, 479-507. Retrieved October 10, 2006 from ERIC database.

Guskey, T. & Passaro, P. (1994). Teacher Efficacy: A Study of Construct Dimensions. *American Educational Research Journal,* 31(3), 627-643 Retrieved March 20, 2007 from ERIC database.

Morris-Rothschild, B. & Brassard, M. (2006). Teachers' Conflict Management Styles: The Role of Attachment Styles and Classroom Management Efficacy. *Journal of School Psychology,* 44, 105-121. Retrieved March 31, 2007 from ERIC database.

Mujis, D. & Reynolds, D. (2002). Teachers' Beliefs and Behaviors: What Really Matters?, *Journal of Classroom Interaction*, 37(2), 3-15 Retrieved March 15, 2007 from ERIC database.

Murdock, T. & Miller, A. (2003, March). Teachers as Sources of Middle School Students' Motivational Identity: Variable-Centered and Person-Centered Analytic Approaches. *The Elementary School Journal*, 103(3), 383-299. Retrieved March 22, 2007 from ERIC database.

Murphy, C. & Walls, R. (1994, April). Concurrent and Sequential Occurrences of Teacher Enthusiasm. *Paper presented at the Annual Meeting of the American Educational Research Association*, 1-33. Retrieved March 22, 2007 from ERIC database.

Patrick, P., Ryan, A., & Kaplan, A. (2007). Early Adolescents' Perceptions of the Classroom Social Environment, Motivational Beliefs, and Engagement. *Journal of Educational Psychology*, 99(1), 83-98. Retrieved March 20, 2007 from ERIC database.

Ryan, A. & Patrick, H. (2001). The Classroom Social Environment and Changes in Adolescents' Motivation and Engagement During Middle School. *American Educational Research Journal*, 38(2), 437-460. Retrieved March 24, 2007 from ERIC database.

Schweinkle, A., Meyer, D., & Turner, J. (2006, May/June). Striking the Right Balance: Students' Motivation and Affect in Elementary Mathematics. *Journal of Educational Research*, 99(5), 271-293. Retrieved October 1, 2006 from ERIC database.

Tschannen-Moran, M. & Hoy, A.W. (2001, February). Teacher Efficacy: Capturing an Elusive Construct. *Teaching and Teacher Education*, 17, 783-805. Retrieved October 10, 2006 from ERIC database.

Tschannen-Moran, M., Woolfolk Hoy, A. & Hoy, W.K. (1998). Teacher Efficacy: Its Meaning and Measure. *Review of Educational Research*, 68, 202-248. Retrieved March 26, 2007 from ERIC database.

Waxman, H. & Eachs, M. (1983, July/August). Utilizing Students' Perceptions and Context Variables to Analyze Effective Teaching: A Process-Product Investigation, *Journal of Educational Research*, 76(6), 321-325. Retrieved March 24, 2007 from ERIC database.

Wentzel, K. (1997). Student Motivation in Middle School: The Role of Perceived Pedagogical Caring. *Journal of Educational Psychology*, 89(3), 411-419. Retrieved March 24, 2007 from ERIC database.

Woolfolk, A. & Brooks, D. (1985, March). The Influence of Teachers' Nonverbal Behaviors on Students' Perceptions and Performance. *The Elementary School Journal*, 85(4), 513-525. Retrieved March 24, 2007 from ERIC database.

Zeldin, A. & Pajares, F. (2000). Against the Odds: Self-Efficacy Beliefs of Women in Mathematical, Scientific, and Technological Careers. *American Educational Research Journal*, 37, 215-246. Retrieved October 10, 2006 from ERIC database.

Appendixes

Appendix A

May 2, 2007

Mr. Dennis Yack
Graduate Student
Marygrove College

Dear Mr. Yack,

Your proposal was reviewed by the Institutional Review Board (IRB) on May 2, 2007. Based on the review, your proposal has been APPROVED.

This approval is for one year and will end on May 2, 2008. If you have not completed your project at this time, you must submit a Renewal form.

If at any time you make modifications in your project, you must submit a Research Project Modification form.

Finally, when you have completed your project, you must submit a Final Summary form.

If you have further questions, please contact Patricia Kwasek, chair of the IRB.

Sincerely,

Patricia Kwasek, Chair
Institutional Review Board

Appendix B

Informed Consent Form

Dear Participant and Parent/Guardian,

I am conducting a study that will suggest the degree of correlation between students' perceptions of teacher efficacy as it relates to mathematical skill acquisition and the students' academic achievement. The study is being conducted in accordance with the thesis format for a graduation requirement for a Master's of Education Degree at Marygrove College in Detroit, Michigan. The title of my study is "The Effects of Teacher Efficacy on Mathematical Skill Acquisition: The Students Viewpoint"

Participation in the study is completely a voluntary decision by the participants and the participants' legal guardian. Fictitious participant names and school will be used in the data in order to protect their privacy. Participants may withdraw from the study at any time without penalty.

Each participant will take a Likert scale survey to determine their level of agreement with teacher efficacy as it relates to mathematical skill acquisition. Students will be assigned numbers instead of using their names, to protect the confidentiality of the student. Their levels of agreement will then be compared with their cumulative mathematics GPAs to determine the relationship between the two.

The estimated length of time for which the subject is participating in the study is 15 minutes. All information will remain confidential and anonymous except as may be required by federal, state or local law and kept on file for up to three years.

Sincerely,

Dennis Yack

If you or your student has any questions or concerns, feel free to contact:

Dennis Yack, Graduate Student and Research Investigator, Marygrove College
Email: vbcoachyack@hotmail.com

Or

Dr. Eugene R. Shaw
Associate Professor of Education, Marygrove College
313.927.1317
Email: eshaw@marygrove.edu

Appendix C

ACKNOWLEDGEMENT AND CONSENT

I, _____, hereby state that:
(Print Full Legal Name)

1. I have read all information provided on the consent form as it related to the research study entitled "The Effects of Teacher Efficacy on Mathematical Skill Acquisition: The Students Viewpoint" conducted by Dennis Yack, Graduate Student, Marygrove College, Detroit, MI.
2. I have been given the opportunity to ask any questions I may have and have had all questions answered to my satisfaction.
3. I have been given a fully copy of this document "Acknowledgement and Consent" form and a copy of the "Consent Form" and all of the required signatures.
4. By signing this "Acknowledgement and Consent" form, I consent to being a participant in the study entitled "The Effects of Teacher Efficacy on Mathematical Skill Acquisition: The Students Viewpoint".
5. I understand that the study will be supervised by Dr. Eugene R. Shaw of Marygrove College.

_____ _____
Print Participant's Full Legal Name Date

_____ _____
Signature of Participant Date

_____ _____
Print Full Name of Legal Guardian Date

_____ _____
Signature of Legal Guardian Date

As the investigator in the study entitled "The Effects of Teacher Efficacy on Mathematical Skill Acquisition: The Students Viewpoint", I hereby state to the best of my knowledge, all of the statements made in the statements listed above are true. Any participants involved in this study may withdraw or discontinue participation in this study at anytime with penalty of any kind.

_____ _____
Print Full Legal of Investigator Date

_____ _____
Signature of Investigator Date

Appendix D

SURVEY

A number of statements about your math class are listed below. The purpose is to gather information regarding the attitudes of 5th graders concerning these statements. There is no right or wrong answers. We are interested only in your honest feelings. Your answers will remain confidential. No one will see them but the administrator.

INSTRUCTIONS: Please indicate your feelings about each statement by **circling** the appropriate answer below the statement.

Answer Key: 4 = strongly agree
3 = agree
2 = disagree
1 = strongly disagree

1. My math teacher respects my opinions on math. **Strongly Agree Agree Disagree Strongly Disagree**
2. My math teacher really understands how I feel about math. **Strongly Agree Agree Disagree Strongly Disagree**
3. My math teacher helps me when I'm confused about a math problem. **Strongly Agree Agree Disagree Strongly Disagree**
4. My math teacher allows us to discuss our math work with each other. **Strongly Agree Agree Disagree Strongly Disagree**
5. My math teacher encourages us to share math ideas with one another. **Strongly Agree Agree Disagree Strongly Disagree**
6. My math teacher encourages us to be helpful to other students with their math work. **Strongly Agree Agree Disagree Strongly Disagree**
7. My math teacher makes learning math fun. **Strongly Agree Agree Disagree Strongly Disagree**
8. My math teacher shows excitement for math. **Strongly Agree Agree Disagree Strongly Disagree**
9. My math teacher's excitement helps me to learn math better. **Strongly Agree Agree Disagree Strongly Disagree**
10. My math teacher explains math concepts well. **Strongly Agree Agree Disagree Strongly Disagree**
11. My math teacher provides suggestions and feedback. **Strongly Agree Agree Disagree Strongly Disagree**
12. My math teacher allows me to ask math questions. **Strongly Agree Agree Disagree Strongly Disagree**
13. My math teacher will not allow students to make fun of other students' math ideas in class. **Strongly Agree Agree Disagree Strongly Disagree**

14. My math teacher allows students to use different ways to learn math. **Strongly Agree Agree Disagree Strongly Disagree**
15. My math teacher will not allow students to make fun when a student gives a wrong answer to a math problem. **Strongly Agree Agree Disagree Strongly Disagree**

Thank you for your participation.

Appendix E

FINAL SUMMARY

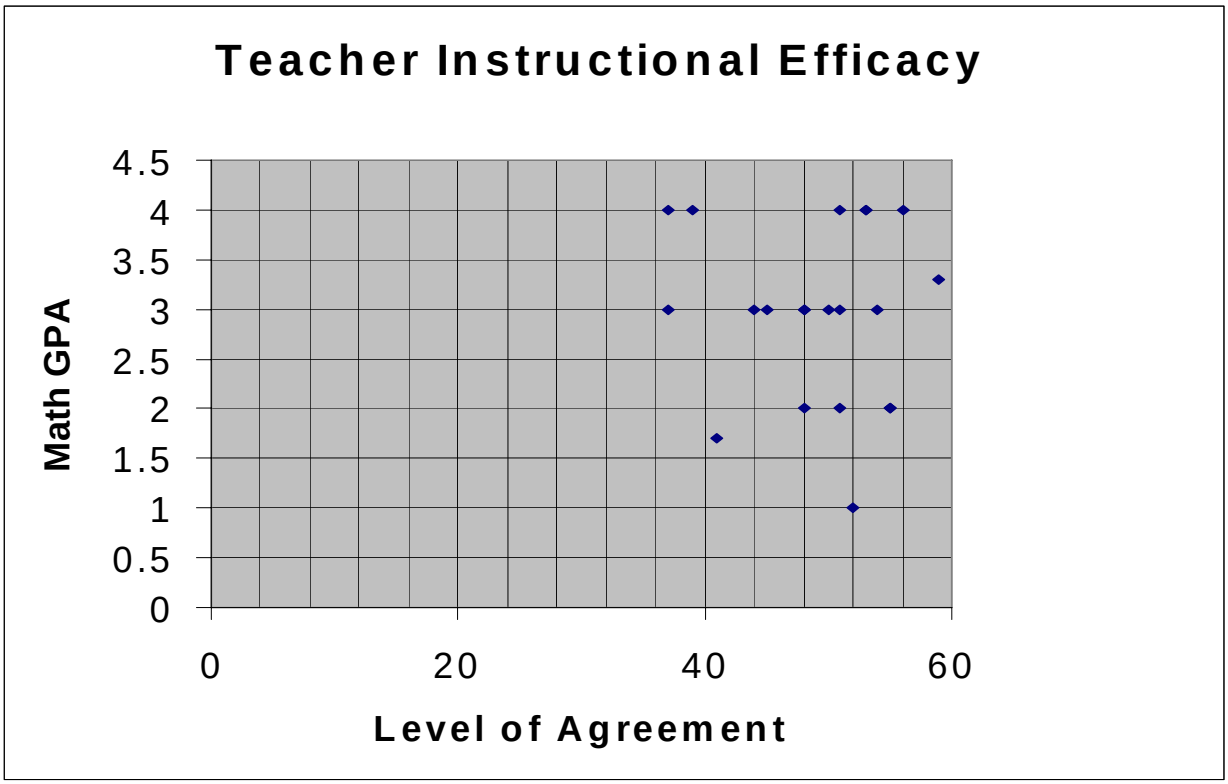
Title of Research Project: The Effects of Teacher Instructional Efficacy on Mathematical Skill Acquisition: The Students Viewpoint

Primary Investigator: Dennis Yack

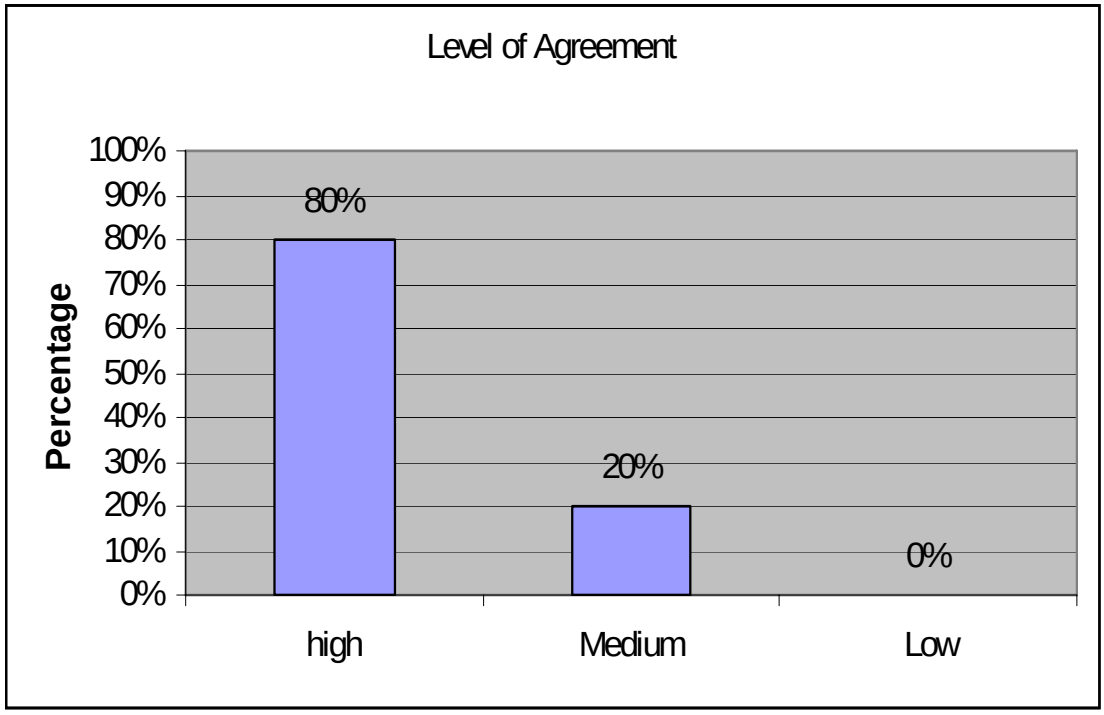
Date Completed: July 2007

Send this form to:
Patricia Kwasek, Chair
Institutional Review Board
Liberal Arts, Library Lecture Hall 207

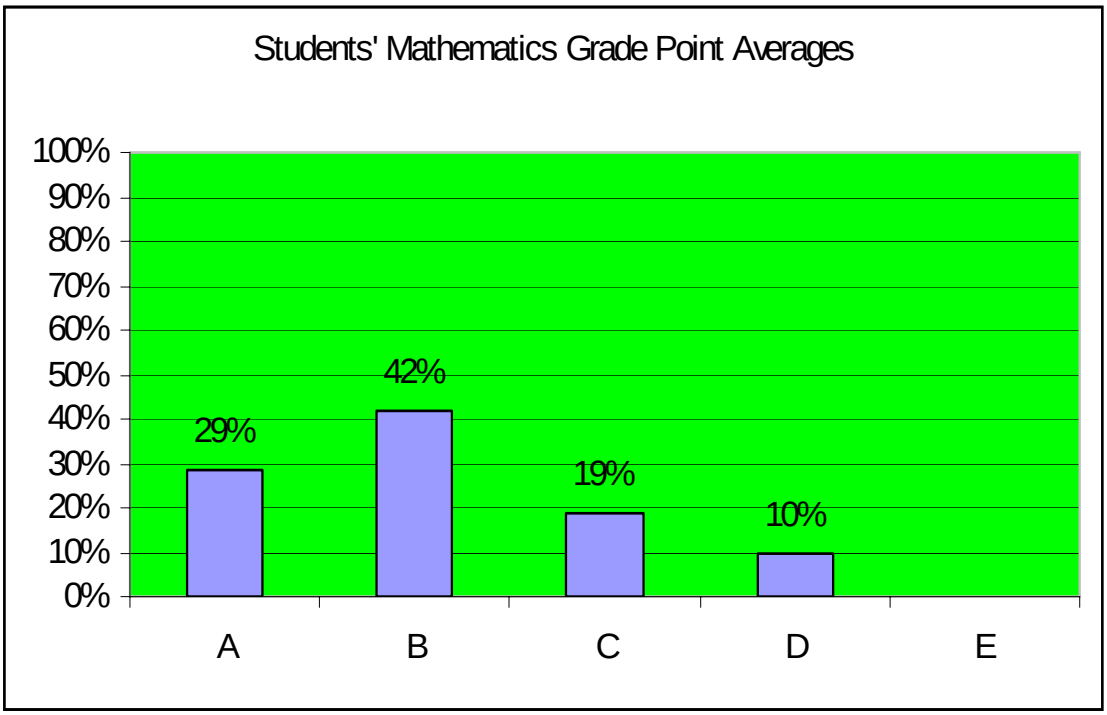
Appendix F


Teacher Instructional Efficacy
Math GPA
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
Level of Agreement

Appendix G


Level of Agreement
Percentage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
80%
20%
0%
high
Medium
Low

Appendix H


Students' Mathematics Grade Point Averages
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
29%
42%
19%
10%
A
B
C
D
E